

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior listings and versions of claims in this application.

1. (Currently Amended) An apparatus for splitting apart a substrate comprising two adjoining wafers defining between them a cleavage plane, which comprises:

means for feeding a plurality of substrates disposed in a substrate-storage direction;

splitter means comprising a comb assembly that includes a plurality of openings for receiving the substrates, with each opening receiving a substrate, and moving jaws for splitting apart the wafers; and

means for performing controlled displacement of certain wafers after they have been split apart in a direction that is substantially parallel to the substrate-storage direction.

2. (Original) The apparatus of claim 1, wherein the splitter means splits the wafers of the substrates simultaneously.

3. (Original) The apparatus of claim 1, wherein the splitter means splits the wafers of the substrates sequentially.

4. (Currently Amended) The apparatus of claim 1, wherein the means for feeding substrates comprises a cradle-type support for holding the substrates and a pusher suitable for moving substrates ~~from~~ out of the cradle-type support.

5. (Currently Amended) ~~The~~ An apparatus ~~of claim 1, wherein:~~ for splitting apart a substrate comprising two adjoining wafers defining between them a cleavage plane, which comprises:

means for feeding a plurality of substrates disposed in a substrate-storage direction;

the splitter means comprises comprising a first jaw-forming comb assembly that includes a plurality of openings for receiving the substrates, with each opening receiving a

substrate, and at least two moving jaws situated on either side of a gap for receiving the substrates and splitting apart the wafers;

wherein the jaws are suitable for holding the substrates once the jaws have clamped onto the substrates;

wherein each jaw comprises first and second portions that have corresponding concave housings for receiving and holding the substrates; and

wherein the corresponding housings have a shape that is configured and adapted so that once the first and second portions of the two jaws have clamped onto the substrates, the two wafers of each substrate are urged apart by co-operation between the shapes of the housings of the first portions of the two jaws and the second portions of the two jaws, respectively; and

means for performing controlled displacement of certain wafers after they have been split apart in a direction that is substantially parallel to the substrate-storage direction.

6. (Original) The apparatus of claim 5, wherein the two moving jaws of the first comb assembly are identical.

7. (Original) The apparatus of claim 5, wherein each of the concave housings of the first and second jaw portions of the first comb assembly includes a respective projecting element for engaging a substrate at its cleavage plane, the projecting element defining a general plane in which it extends.

8. (Original) The apparatus of claim 7, wherein, in each jaw of the first comb assembly:

each concave housing of the first jaw portion presents a profile that is asymmetrical on either side of the projecting element and that includes:

a first wall oriented at a first general angle of incidence relative to the general plane of the projecting element to co-operate with a first side of the substrate; and

a second wall oriented with a second general angle of incidence relative to the general plane of the projecting element to co-operate with a second side of the substrate, which second angle of incidence is greater than the first general angle of incidence;

wherein during clamping of the first jaw portions of the first comb assembly on the substrate, the wafer of the substrate that is on the first side of the substrate presents a degree of freedom to move relative to the first portion and in a direction perpendicular to the general plane of the projecting element that is smaller than the degree of freedom to move presented by the substrate wafer which is on the second side of the substrate.

9. (Original) The apparatus of claim 5, wherein, in each jaw of the first comb assembly:

each concave housing of the second jaw portion further presents a profile that is asymmetrical and comprises, on either side of the projecting element:

a first wall oriented with a first general angle of incidence relative to the general plane of the projecting element to co-operate with the second side of the substrate; and

a second wall oriented with a second general angle of incidence relative to the general plane of the projecting element to co-operate with the first side of the substrate, which second angle of incidence is greater than the first general angle of incidence;

wherein during clamping of the second jaw portions of the first comb assembly on the substrate, the substrate wafer on the second side of the substrate presents a degree of freedom to move relative to the second portions and in the direction perpendicular to the general plane of the projecting element that is smaller than the degree of freedom to move presented by the substrate wafer which is on the first side of the substrate; and

wherein the two wafers are urged apart during clamping of the first comb assembly on the substrate.

10. (Original) The apparatus of claim 5, wherein, in each jaw of the first comb assembly, the first portion comprises two members that are disposed on either side of the second portion.

11. (Original) The apparatus of claim 5, wherein, in each jaw of the first comb assembly, the second portion is movable relative to the first portion.

12. (Original) The apparatus of claim 5, wherein the means for achieving controlled displacement of certain substrate wafers after they have been split apart comprises means for moving the second portion of each jaw in translation relative to the first portion of each respective jaw in a direction perpendicular to the general plane of the projecting element.

13. (Original) The apparatus of claim 5, further comprising a second jaw-forming comb assembly having jaws that can be clamped onto the substrates independently of the first and second portions.

14. (Original) The apparatus of claim 13, wherein the second comb assembly further includes a plurality of passages for allowing certain wafers to pass therethrough.

15. (Original) The apparatus of claim 13, further comprising three stations, including a first station for receiving at least one substrate to be split apart, and two additional stations, each for receiving a respective wafer from each split-apart substrate.

16. (Original) The apparatus of claim 15, wherein the first and second comb assemblies are mounted to move relative to the stations and means are provided for displacing the comb assemblies selectively to be in register with each station.

17. (Original) The apparatus of claim 13, wherein each station is provided with a respective pusher.

18. (Original) The apparatus of claim 17, wherein the pusher associated with the first station has housings for receiving the substrates, and the pusher associated with the other stations having housings for receiving respective ones of the wafers obtained by splitting apart each substrate.

19. (Original) The apparatus of claim 17, wherein each housing of the pusher associated with the first station further includes a projecting element therein for engaging the substrate at its cleavage plane.

20. (Currently Amended) ~~The~~ An apparatus ~~of claim 1, further~~ for splitting apart a substrate comprising two adjoining wafers defining between them a cleavage plane, which comprises:

means for feeding a plurality of substrates disposed in a substrate-storage direction;

a separator suitable for movement between a position in which the substrates are disengaged from the separator, and a position in which the substrates are attacked by the separator to split apart the wafers; and

a first comb comprising at least two moving jaws for taking hold of the substrates after the substrates have been attacked by the separator;

wherein the jaws hold the substrates after being clamped thereon; and

each jaw has spaced apart housings so that once the jaws have been clamped onto the substrates, the wafers of the substrates are spaced apart in the housings.

21. (Original) The apparatus of claim 20, wherein the separator has a cross-section in the form of a projecting wedge.

22. (Original) The apparatus of claim 20, further comprising at least two stations, including one station dedicated to splitting substrates and one station dedicated to unloading the split-apart wafers.

23. (Original) The apparatus of claim 22, wherein each station is provided with a respective pusher.

24. (Original) The apparatus of claim 23, wherein the pusher of the station dedicated to splitting substrates has housings for receiving the substrates, which housings in cross section present a generally V-shaped profile.

25. (Original) The apparatus of claim 23, wherein the pusher of the station dedicated to splitting substrates has housings for receiving the substrates, and wherein each housing has a W-shape and a central edge in a bottom portion thereof.

26. (Original) The apparatus of claim 20, which further comprises a second comb at least two moving jaws for clamping the substrates independently of the first and second portions.

27. (Original) The apparatus of claim 26, wherein the second comb further includes a plurality of passages for allowing certain wafers to pass through.

28. (Original) The apparatus of claim 20, further comprising a guide for positioning the substrates in accurate manner therein.

29-41. (Cancelled)

42. (Currently Amended) An apparatus for splitting apart a substrate comprising two adjoining wafers defining between them a cleavage plane, which comprises:

a cradle support for holding a plurality of substrates in a substrate-storage direction

a pusher operatively associated with the cradle support for moving substrates ~~from~~ out of the cradle support;

a first jaw-forming comb assembly that includes a plurality of openings for receiving the plurality of substrates with each opening receiving a substrate, and at least two moving jaws situated on either side of a gap for receiving the substrates, the jaws holding the substrates once ~~the~~ clamped thereonto, with the movement of one of the comb assembly or the jaws caused causing the wafers to split apart; and

a member for moving one portion of each jaw in translation relative to another portion of the jaw in a direction perpendicular to the general plane of ~~the projecting element a~~

substrate storage direction thus performing controlled displacement of wafers after they have been split apart in a direction that is substantially parallel to the substrate-storage direction.

43. (Currently Amended) The apparatus of claim 42 wherein the jaw portions have corresponding ~~one~~ housings for receiving and holding the substrates; and wherein the corresponding housings have a shape that is configured and adapted so that once the portions of the two jaws have clamped onto the substrates, the two wafers of each substrate are urged apart by co-operation between the shapes of the housings.

44. (New) The apparatus of claim 20, which further comprises means for performing controlled displacement of certain wafers after they have been split apart in a direction that is substantially parallel to the substrate-storage direction.

45. (New) An apparatus for splitting apart a substrate comprising two adjoining wafers defining between them a cleavage plane, which comprises:

a cradle support for holding a plurality of substrates in a substrate-storage direction

a pusher operatively associated with the cradle support for moving substrates from out of the cradle support;

a first jaw-forming comb assembly that includes a plurality of openings for receiving a plurality of substrates, with each opening receiving a substrate, and at least two moving jaws situated on either side of a gap for receiving the substrates, the jaws holding the substrates once the clamped thereonto, with the movement of the jaws caused with wafers to split apart; and

a member for moving one portion of each jaw in translation relative to another portion of the jaw in a direction perpendicular to the general plane of the projecting element thus performing controlled displacement of wafers after they have been split apart in a direction that is substantially parallel to the substrate-storage direction.

46. (New) The apparatus of claim 45 wherein each opening is part of a housing that includes a projection element for engaging a substrate at its cleavage plane.